1915. U. S. Weather Bureau. Station Regulations, 1915, paragraph 425:

Forecasts of "fair," "partly cloudy," or "cloudy" will be made when precipitation to the amount of 0.01 inch or more is not expected.

In England, the term "fair" as used by meteorologists has much the same meaning that it has in the United States. Murray's New English Dictionary contains the following definition:

Of the weather. Favourable, not wet or stormy. Also with some notion of sense 1 [beautiful]: Fine, bright, sunny. Now sometimes contrasted with *fine*, as "the weather was fair, but not fine."

British official usage in this connection is described in a letter from the Director of the Meteorological Office, London, dated December 2, 1915, as follows:

I am in receipt of your letter of November 12th, asking whether the terms "fair" and "fine" have ever been officially defined by this Office. No official definitions have been put forward, but the words have come to be used fairly regularly in our forecasts.

Both would only be applied to a day or an interval during which there was no precipitation. In using the word "fine" the forecaster has in mind a period over which the weather can be described by the Beaufort letters "b" or "bc," while "fair" would apply to an interval to which the Beaufort letters "bc" and "c" would be applicable, but I do not think anyone would quarrel with the use of the word "fine" to describe a period during which the sky was covered by a veil of high cloud, say, of the cirro-stratus type, even if technically the cloud amount might be represented by the figure 10 or by the Beaufort letter "o."

[The Beaufort letters referred to are officially defined by the British Meteorological Office as follows: b=blue sky, cloudless; bc=a combination of blue sky with detached clouds; c=sky mainly cloudy but with openings between the clouds; o=completely overcast.]

THE AURELIA ALTO-CUMULUS CLOUD.

By GEORGE REEDER, Section Director.

[Dated: Weather Bureau, Columbia, Mo., June 27, 1914.]

The accompanying rough sketch that I made in Columbia, Mo., at about 8:30 a. m., June 25, 1914, shows an interesting and unusual cloud formation. I do not own a camera, otherwise I would have photographed them; and, it goes without saying, I am a poor sketch artist. I have named the cloud "Aurelia" because each time (this being the third) I have observed them my thoughts instantly flashed to the jellyfish (*Cyanea arctica*), called "stinging nettle" by some southern fishermen.

This cloud formation, so far as my own observations go, seems characteristic of the Middle West or semiarid regions. I never observed a similar formation in other parts of the country during former years. Twice these clouds were seen in the southern part of the sky, and once in the north, rather low down. Each time, though, it was during periods of prolonged drought, and the formation was the same, i. e., alto-cumuli drifting slowly eastward, with long underneath streamers of hairlike texture, bent backward toward the west.

Presumably, then, this form of cloud is the result of two currents of air, flowing in opposite directions. In other words, the alto-cumuli float on eastward until they meet and enter the current coming from the east, which is, without doubt, a dry, descending one. The cumuli then soon begin to disintegrate and evaporate, small particles

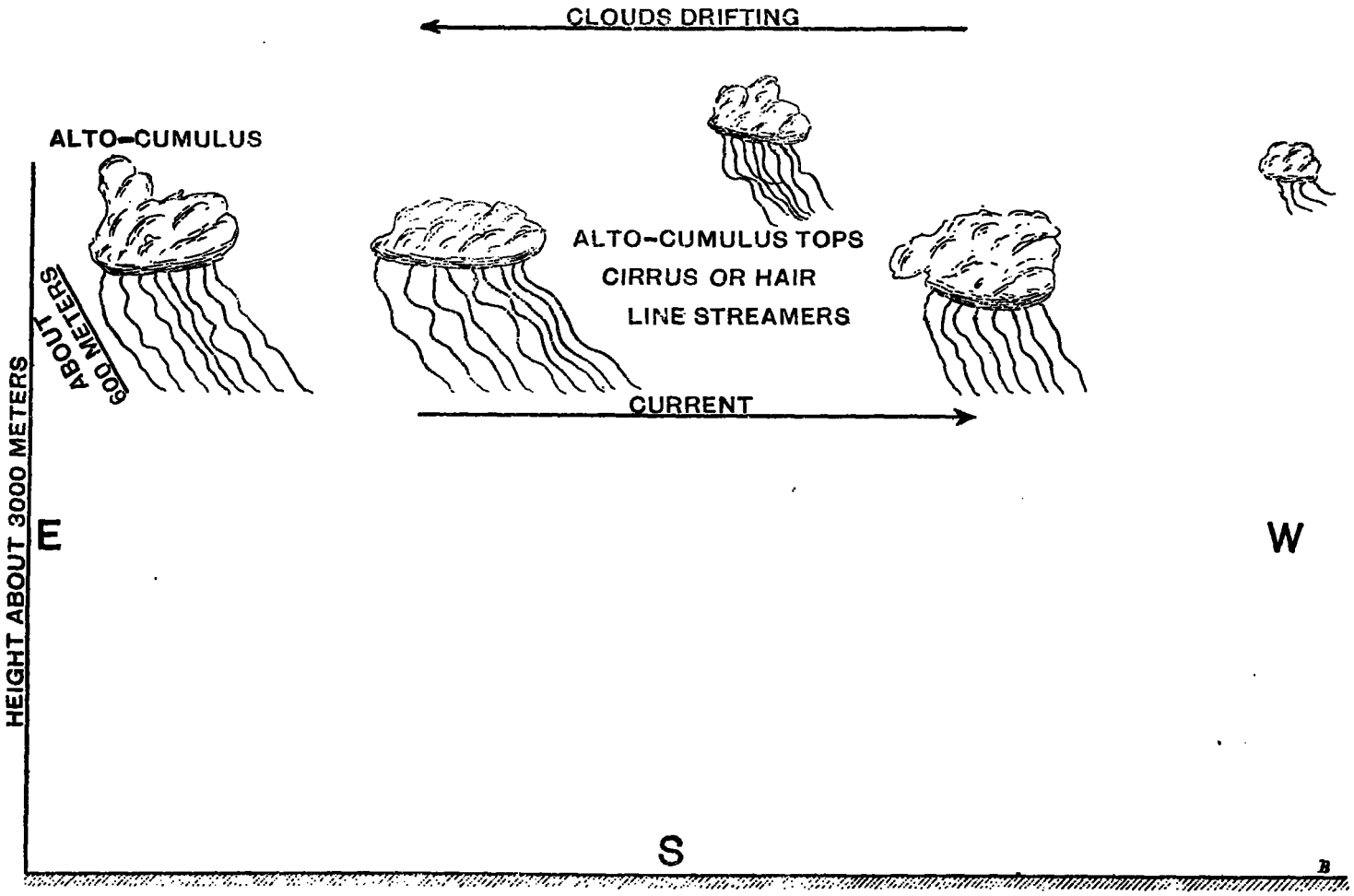

FIG. 1.—Peculiar form of alto-cumulus observed by Geo. Reeder at Columbia, Mo., 8:30 a. m., June 25, 1914.

of cloud being carried down in streamers, which in turn soon disappear. In fact, these clouds, streamers and all, disappear by evaporation in about 30 to 40 minutes after the descending movement begins.

TORNADOES IN KANSAS.

By S. D. FLORA, Observer, U. S. Weather Bureau.

[Dated: Weather Bureau, Topeka, Kans., Dec. 18, 1915.]

Kansas has been so commonly considered the tornado State of the country that the term "Kansas cyclone" has almost become a part of the spoken English language, but this idea is as misleading as the use of the word "cyclone" to designate what should properly be called a *tornado*, that is, an exceedingly violent whirling storm of small diameter, with a pendant, funnel-shaped cloud.

It seems that a large part of this undesirable reputation of the State has been the result of undue publicity given such spectacular storms by the early settlers and continued by the activities of later disseminators of news.

That tornadoes do occur in the State practically every year and sometimes several within the same year can not be denied, but it should be considered that, while the area of the State exceeds 80,000 square miles, the path of an average tornado does not cover more than 25 square miles and many are a great deal smaller, so that one can generally be represented by a pin scratch less than an inch long on a map of the State of the size usually given in an atlas.

In a report on tornadoes of the United States for the eight years, 1889–1896, which is the most complete of the kind published, Prof. A. J. Henry [1] of the Weather Bureau has published data indicating that the total number of tornadoes in Kansas is somewhat greater than the number in any other State. When the relative areas are considered, however, the number of tornadoes in Kansas per unit area is practically the same as the corresponding number for Iowa and is but slightly greater than the number for Illinois, yet neither of these States has Kansas's reputation of being a tornado State. Prof. Henry in the same report has also deduced that even in the States where such storms occur most frequently "the probability that any area 100 miles square will be visited by a tornado in any year is generally less than certainty," and further, "for any specific area or farm of 1 square mile the probability [of being visited by a tornado] is less than one-sixteenth of 1 per cent per century." [2]

During the 10 years, 1889–1896 and 1914–15, for which definite information regarding the destruction by tornadoes is available, the average annual number of deaths in Kansas directly due to these storms is 14, or less than the number of deaths by lightning as shown by the mortality statistics of the State Board of Health, and much less than the number caused by any disease of common occurrence in the State. The average property loss for the period, even though it was almost doubled by the recent tornado at Great Bend, is insignificant when compared with the total wealth of the State or the annual losses by flood and hail, yet neither of these has attracted the notice given the damage inflicted by tornadoes.

The months of greatest frequency of tornadoes in the State are indicated by Table 1 compiled from the report of Lieut. John P. Finley [3] covering the years 1859–1887, the report of Prof. A. J. Henry covering the period 1889–1896, and the monthly reports of the Kansas section for the years 1914 and 1915.

TABLE 1.—*Total number of tornadoes, by months, reported in Kansas, 1859–1887, 1889–1896, 1914–15.*

January	0
February	1
March	16
April	41
May	66
June	54
July	20
August	15
September	8
October	3
November	4
December	0
Entire period	228

With the present available data it is idle to speculate whether any part of the State is more likely to be visited by these storms than any other part. The report of Lieut. Finley, while it covers a long period of time, is admittedly incomplete, being obtained "from all available sources" years after many of the storms had occurred, which means that many tornadoes might have occurred in sparsely settled communities during the early part of the record without having been reported; the report of Prof. Henry and those of the years 1914–15 cover too short a period to shed much light on this question.

Present knowledge of the cause of these storms discredits the idea that their formation is favored or hindered by such slight differences in topography as exist in a State as comparatively level as Kansas. Also there is no reason to believe they are becoming any more or less frequent than formerly. It is probable losses due to their destructive effects will increase as the land becomes more thickly settled, but not necessarily in proportion to the total population and wealth of the State.

The following Tables 2, 3, and 4 give a record of tornadoes in Kansas for all the years for which data are at present available.

[1] Tornadoes, 1895–96, by Alfred J. Henry, p. xxiii–xl, charts I–VIII. (Report of the Chief of the Weather Bureau, 1895–96. Washington, 1896. 4°.)

[2] See also *Abbe, C.*—Tornado frequency per unit area, this REVIEW, June, 1897, p. 250.—EDITOR.

[3] *Finley, John P.* The tornadoes of Kansas for 29 years, 1859–1887. J. H. Soulé, Washington, 1888. n. p. map. 16½ cm.